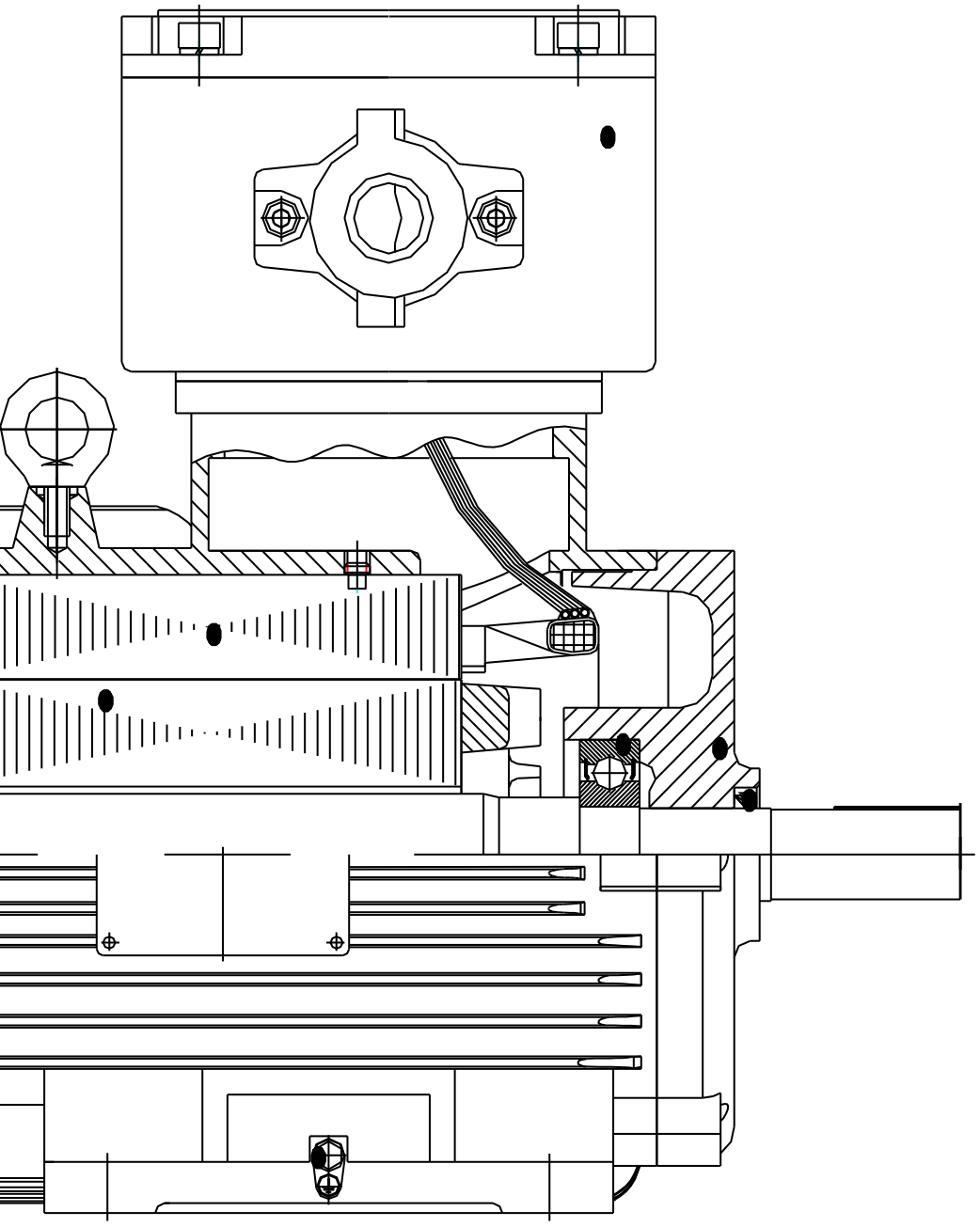
THOMPSON
Electric Industries INC

MANUAL INSTRUCTION

YBX3 SERIES
THREE PHASE EXPLOSION - PROOF
INDUCTION MOTOR



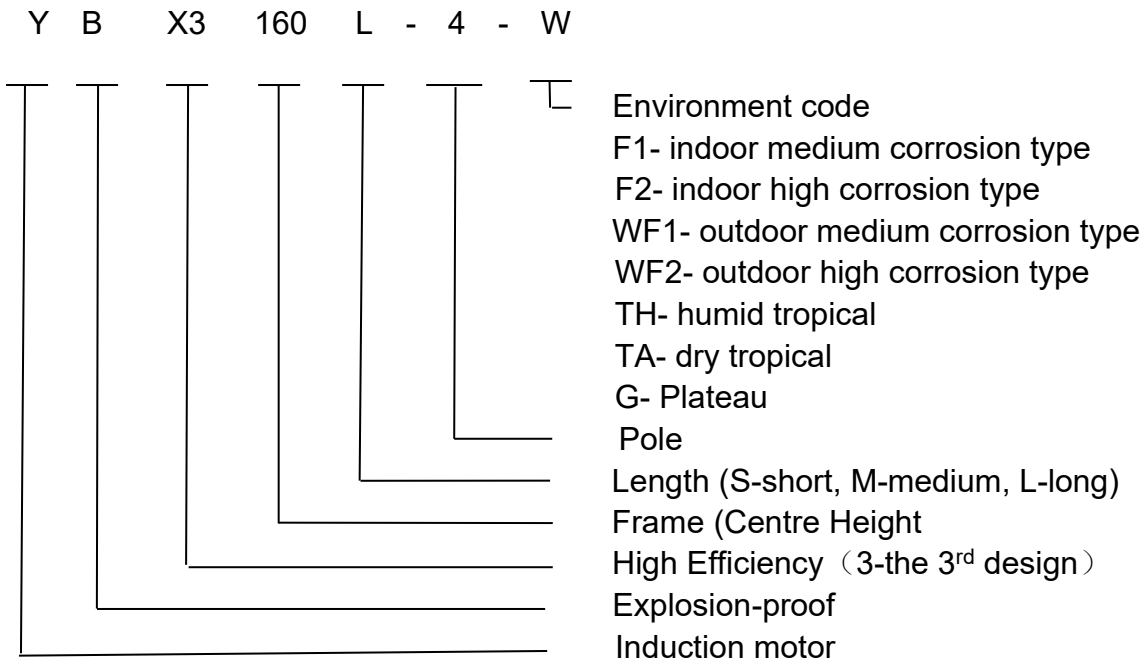
CONTENTS

1. Outlines

YBX3 series 3-phase explosion-proof induction motor are made according to electrical apparatus for explosive gas atmospheres-part 1: General requirements>and<Electrical apparatus for explosive gas atmospheres-part2: Flameproof enclosure “d”>.Explosion-proof mark includes dⅠ, dⅡAT4, dⅡBT4, dⅡCT4. Motors can be used with the electrical apparatus for atmosphere including CH4 or dust or the explosive gas atmosphere(dⅠ)under the coal mine or be used as general power equipment for the atmosphere including ignitable gas Class A and B, kind of T1 to T4, or the mixture with stream and air. Administer criterion is JB/T7565.1-2004 and MT451-1995.

Remarks: The series product efficiency level attain GB 18613-2006 《Minimum allowable values of energy efficiency and the energy efficiency grades for small and medium three-phase asynchronous motors》of minimum allowable values of energy efficiency, belong to grade 3.

2. Instruction of product type and name



3. Applicable scope and conditions

3.1 Applicable common ignitable gas, steam rank, temperature, see table 1.

Table 1

Class	T1	T2	T3	T4
I	Methane, Ammonia, Acetic acid	Butanol, Acetic anhydride	Cyclohexane	/
IIA	Ethane, Propane, Acetone, Styrene, Benzene, Toluene, Carbon monoxide	Ethane, Ethanol, Propylene, Butyl acetate, Amyl acetate, Chlorine b Tong, Ethyl acetate, Methanol	Pentane, Ethane, Kwai alkanes, Octane, Kwai alkanes, Gasoline	Ethyl ether, Acetic acid
IIB	City gas, Coke oven gas	Epoxy ethane, 1.3 a butadiene, Ethylene	Dimethyl ether, Hydrogen sulfide	Ethyl methyl, Diethyl ether, Tetrachloroethylene
IIC	Chlorine water gas, Chlorine	Acetylene	/	/

Remark: application conditions are under the mine and the main gas is CH4 with the “d I” mark.

3.2 Working conditions

Environment air temperature changes along with season, but does not exceed 35℃(under mine)or 50℃(for factory).The lowest temperature is -15℃

3.2.2 The altitude above sea level is below 1000m.

3.2.3 The maximum relative air humidity does not surpass 95% when the temperature is 25℃ under the mine or the temperature does not surpass 25℃ in the wettest month for factory when the maximum relative air humidity does not surpass 90% in the same month.

3.2.4 The rated voltage is 380V, 660V, 380/660V. Other voltage is available.

3.2.5 The rate frequency is 50Hz. 60Hz is available.

3.2.6 The electric motor can work continuously and be started with rated voltage.

3.2.7 The insulation of the electric motor is class and the temperature rising cannot surpass 80K.The value gap is 1.

4. The electric motor main specification and installment structural style.

4.1 This series electric motor main specification, please look at Table 2

Table 2

<table>
<tr><td rowspan="2">Frame No</td><td colspan="5">Asynchronous speed r/min</td></tr>
<tr><td>3600</td><td>1800</td><td>1200</td><td>900</td><td>720</td></tr>
<tr><td></td><td colspan="5">Power</td></tr>
<tr><td>80M1</td><td>0.75</td><td>0.55</td><td>0.37</td><td>0.18</td><td>-</td></tr>
<tr><td>80MM2</td><td>1.1</td><td>0.75</td><td>0.55</td><td>0.25</td><td>-</td></tr>
<tr><td>90S</td><td>1.5</td><td>1.1</td><td>0.75</td><td>0.37</td><td>-</td></tr>
<tr><td>90L</td><td>2.2</td><td>1.5</td><td>1.1</td><td>0.55</td><td>-</td></tr>
<tr><td>100L1</td><td rowspan="2">3</td><td>2.2</td><td rowspan="2">1.5</td><td>0.75</td><td>-</td></tr>
<tr><td>100L2</td><td>3</td><td>1.1</td><td>-</td></tr>
<tr><td>112M</td><td>4</td><td>4</td><td>2.2</td><td>1.5</td><td>-</td></tr>
<tr><td>132S1</td><td>5.5</td><td rowspan="2">5.5</td><td rowspan="2">3</td><td rowspan="2">2.2</td><td>-</td></tr>
<tr><td>132S2</td><td>7.5</td><td>-</td></tr>
<tr><td>132M1</td><td>-</td><td rowspan="2">7.5</td><td>4</td><td rowspan="2">3</td><td>-</td></tr>
<tr><td>132M2</td><td>-</td><td>5.5</td><td>-</td></tr>
<tr><td>160M1</td><td>11</td><td rowspan="2">11</td><td rowspan="2">7.5</td><td>4</td><td>-</td></tr>
<tr><td>160M2</td><td>15</td><td>5.5</td><td>-</td></tr>
<tr><td>160L</td><td>18.5</td><td>15</td><td>11</td><td>7.5</td><td>-</td></tr>
<tr><td>180M</td><td>22</td><td>18.5</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>180L</td><td>-</td><td>22</td><td>15</td><td>11</td><td>-</td></tr>
<tr><td>200L1</td><td>30</td><td rowspan="2">30</td><td>18.5</td><td rowspan="2">15</td><td>-</td></tr>
<tr><td>200L2</td><td>37</td><td>22</td><td>-</td></tr>
<tr><td>225S</td><td>-</td><td>37</td><td>-</td><td>18.5</td><td>-</td></tr>
<tr><td>225M</td><td>45</td><td>45</td><td>30</td><td>22</td><td>-</td></tr>
<tr><td>250M</td><td>55</td><td>55</td><td>37</td><td>30</td><td>-</td></tr>
<tr><td>280S</td><td>75</td><td>75</td><td>45</td><td>37</td><td>-</td></tr>
<tr><td>280M</td><td>90</td><td>90</td><td>55</td><td>45</td><td>-</td></tr>
<tr><td>315S</td><td>110</td><td>110</td><td>75</td><td>55</td><td>-</td></tr>
<tr><td>315M</td><td>132</td><td>132</td><td>90</td><td>75</td><td>55</td></tr>
<tr><td>315L1</td><td>160</td><td>160</td><td>110</td><td>90</td><td>75</td></tr>
<tr><td>315L2</td><td>200</td><td>200</td><td>132</td><td>110</td><td>90</td></tr>
<tr><td>355S1</td><td>(185)</td><td>(185)</td><td rowspan="2">160</td><td rowspan="2">132</td><td rowspan="2">(90)</td></tr>
<tr><td>355S2</td><td>(200)</td><td>(200)</td></tr>
<tr><td>355M1</td><td>(220)</td><td>(220)</td><td>(185)</td><td rowspan="2">160</td><td>110</td></tr>
<tr><td>355M2</td><td>250</td><td>250</td><td>185</td><td>132</td></tr>
<tr><td>355L1</td><td>(280)</td><td>(280)</td><td>220</td><td>185</td><td>160</td></tr>
<tr><td>355L2</td><td>315</td><td>315</td><td>250</td><td>200</td><td>(185)</td></tr>
</table>

Remark: 1 and 2 after S M and L means the different power in the same frame No. The power in the parenthesis is not commendatory.

4.2 This series electric motor main specification please looks at Table 3

Table 3

Frame No	Structure and installment code number (IM)
80-112	B3、B5、B6、B7、B8、B14、B34、B35、V1、V3、V5、V6、V15、V18、V36
132-160	B3、B5、B6、B7、B8、B35、V1、V3、V5、V6、V15、V36
180-280	B3、B5、B35、V1
315-355	B3、B35、V1

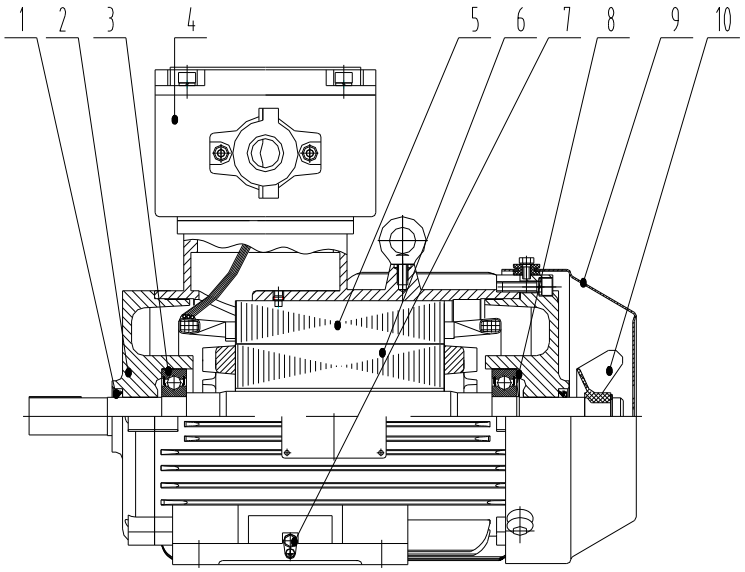
5. The main structure summarizes

5.1 The terminal box is on the top of this series motor, which can be rotated in four directions. It is suitable to the rubber cable or the steel pipe wiring. The terminal box can have 3 or 6 power lines and one earth line, and the cable gland size can be M10 or two M16.

5.2 The motor frame no above 250 can be greased continually and for the motor frame 180 to 250, can be same when the customer wants.

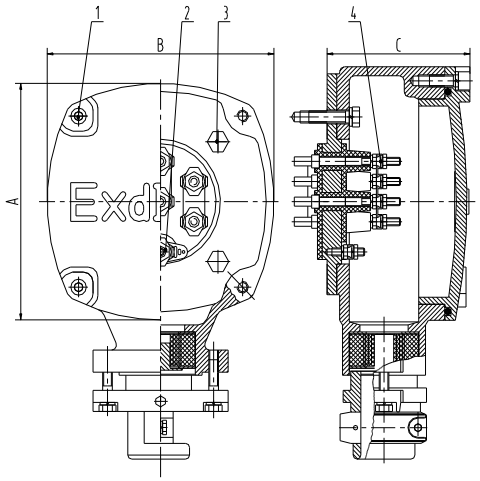
5.3 The series electric motor main body structure, please look at drawing No 1. The connecting box structure, please look at drawing No 2.

Drawing No 1.



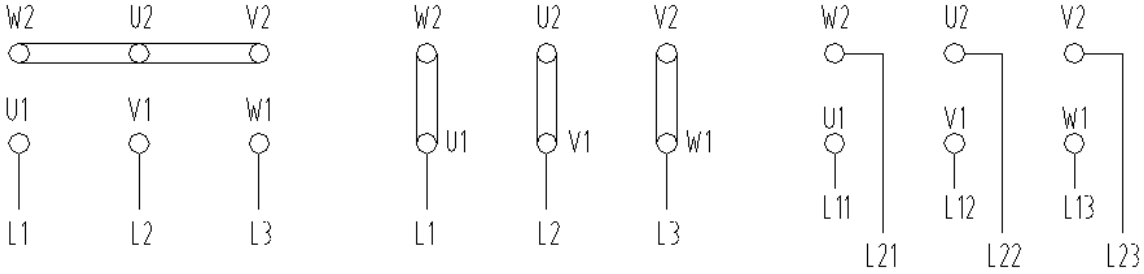
1-Sealing ring 2-End cover 3-Bearing 4-Junction box 5-Stator 6-Rotor 7-Grounding card 8-Wave spring 9-Fan cover 10-Fan

Drawing No 2.



Frame No.	A	B	C	1	2	3	4
YBX3 80～112	169	169	116	M8×25	M5	M8×25	M5
YBX3 132～180	202	202	116	M10×30	M6	M10×30	M6
YBX3 200～225	235	235	148	M12×30	M8	M12×45	M8
YBX3 250～280	310	310	168	M12×40	M10	M12×50	M10
YBX3 315～355	360	360	200	M12×40	M16	M16×60	M16

5.4 The connection of the motor which power is equal to or less than 3KW is star for the rated is 380V and the others are delta.



Conn. Y　　Conn. Δ　　Conn. Y/Δ

6. Explosion—proof main point

6.1 The series electric motor is explosion-proof motor , the outer covering of the motor should not damage or distorted causing to the failing to explosion-proof , and the other explosive gas should not explode by the fire through the junction plane for the explosion-proof after the inner gas explode . For:

a. The parts of the motor covering, example the end cover, bearing inside cap, terminal

box lid, terminal box base, should pass the hydraulic pressure lest, with the pressure is 1.0MPa and lasted 1 minute.

b. The length of the junction plane for explosion-proof, the gap, the surface roughness, the electric gas between the exposed conductors, between the exposed conductor and the metal covering ,and the creeping distance ,please look at the drawing No.1、2.

c. There are spring washers under the bolts connect the outer covering parts, which can prevent the bolts loosing.

d. The stator housing, end cover, the inner bearing cap, the terminal box, the terminal block, the shaft, and the oil seal is the parts for the explosion–proof.

6.2 Under the worst status, the temperature of the surface of the motor should not surpass +135℃. The factory should use the motor according to table 4.

Table 4

Type of explosive admixture	T1	T2	T3	T4
Allowed temp rising of the surface (℃)	450	300	200	135

7. Install and use

7.1 Preparative before to install

7.1.1. The wrapping is good or not should be checked up before it open.

7.1.2. The dust and the anticorrosive things should be eliminated the motor are installed.

7.1.3. The steps should be done before install the motor.

a. There are a mark and a card number of explosion-proof with the motor. Please check if it fulfills the demand of the using environment.

b. The bolts connecting the outer covering parts should not loose.

c. The parts of outer covering should have not crackled or disfigurements.

d. The grease must be enough, and the tools for grease are good.

e. The insulation resistance should not be lower than 0.38 MΩ when the rated voltage is 380V and should not be lower than 0.66MΩ when the rated voltage is 660V.

7.2 The electric motor uses the elastic shaft coupling transmission; the center of the motor

shaft and center of the drive machine must maintain consistently otherwise can cause the bearing damage.

7.3 The connection between the motor and power.

7.3.1. The outer diameter of the power cable must tally with seal, which material is rubber XH-21. The difference between both outer diameters should not be bigger than 1mm, when the cable gland is fixed, there should be no clearance between the cables and between the seal and terminal box otherwise will lose the explosion-proof performance.

7.3.2. The cable should be fixed between two bows gaskets, the attention core burr is prominent, and should be fixed closely by blocks and the gaskets.

7.3.3. The motor with six terminal bolts can be used with two voltages by 2 different connections. When just 1 cable gland is used, another metal washer, which thickness is 2mm, should not be removed. Otherwise the explosion-proof performance will be losing.

7.3.4. The order of the 3 phase of the power should be same as the motor cable. The rotation should be clockwise.

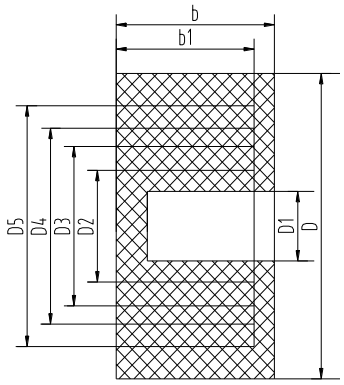
Table 5

Phase sequence	A	B	C
Head	U1	V1	W1
Tail	U2	V2	W2

7.3.5. Other earth bolt should connect with the ground.

7.3.6. After connected correctly, the motor should run with no load, if there is no problem, it can run with load.

7.3.7. Terminal-box Seal Dimensions (MM)



8. Maintains

Frame	Inlet	D	D1	D2	D3	D4	D5	b	b1
80～112	Rubber cable	$\varphi 42^{0}_{-0.062}$	φ14	φ20	φ25	—	—	25	24
132～180		$\varphi 58^{0}_{-0.74}$			φ26	φ31	φ35	26	
200～225		$\varphi 72^{0}_{-0.74}$	φ20	φ26	φ32	φ38	φ42	32	30
250～280		$\varphi 90^{0}_{-0.87}$	φ25	φ31	φ36	φ45	φ50	38	36
315～355		$\varphi 105^{0}_{-0.5}$	φ40	φ46	φ51	φ57	φ64	45	42

8.1. The motor should be clear and check termly. There should no dust in the surface, spraying to the motor with the water cock is not allowed.

8.2. The temperature of the bearing should not surpass +95℃, the bearings must be degreased in 2500 hours at least, change the lubrication if it is not good. Before changing it, the bearing cap, the lubrication cup and wasted lubrication must be cleaned with gasoline, the quantity should reach the 1/2 of the bearing house for 2 poles, 2/3 for 4 poles.

Table 6

Frame No.	Number of poles	Drive end	Non driving end
80	all	180204	180204
90	all	180205	180205
100	all	180206	180206
112	all	180206	180206
132	all	180208	180208
160	2P	180209	180209
	4～8P	180309	180209
180	2P	211ZV	211ZV
	4～8P	311ZV	211ZV
200	2P	212ZV	212ZV
	4～8P	312ZV	212ZV
225	2P	312ZV	312ZV
	4～8P	313ZV	312ZV
250	2P	313ZV	313ZV
	4～8P	314ZV	313ZV
280	2P	314ZV	314ZV
	4～8P	317ZV	314ZV
315	2P	M-316Z1	M316Z1
	4～10P	M-2319Z1	M-319Z1
355	2P	319-ZV2	319-ZV2
	4～10P	2322	322-ZV2

8.3. The explosion-proof surface should be paid attention when the motor Disassembles and assembled, there is no outer bearing cap in the motor frame No. from 80 to 160. the bearings was fixed by the bearing ring. Disassembling the electric motor, we should disassemble the V bearing ring, then the front end-shield, the fan cover, the bolt of the hinder end-shield, remove the hinder end-shield from the rotor, assembling the motor, we should do in reverse.

8.4. Motor affected with damp, must undertake the drying process, the drying furnace or the short circuit current method. In the process of drying, winding temperature rise should be increased gradually, and not more than 155 ℃. Short circuit current method when dry, the motor is under the short circuit state, the input current to the 0.6～0.8 times of the rated current for appropriate, serious damp motor is not easy to use DC electric drying, so as to avoid electrolysis.

8.5. Replacing the winding, the technical data should be got from the company, if not, the motor always work not so well, even burn out.

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